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A NEW SPECIES OF *DROSOPHILA*, *D. GIBBINSI* SP. N., FROM UGANDA (DIPTERA)

By D. Aubertin, M.Sc., F.L.S., F.R.E.S.

On the 4th of March 1932, Mr. E. G. Gibbins collected a series of larvae and pupae from an aquatic situation at Jinja, Uganda. These showed several marked structural adaptations to their environment and a description of them will be published in a separate note.* Reference to the collections in the British Museum, to Sturtevant's (1921) monograph, and to Duda's papers (1924*a* and 1924*b*) indicated that the imagines reared from the pupae, while typical *Drosophila*, were a new species which is here described.

Drosophila gibbinsi sp. n.

♂♀ *Head.* Testaceous; eyes separated at vertex by rather more than one-half total head width; frons diffusely darkened, the anterior central part bearing small fine bristles; parafrontals bearing a few small bristles in addition to the two pairs of frontal bristles, the anterior pair directed outwards and forwards, the posterior pair outwards and backwards; parafacials, face and jowls pale testaceous, bare; third antennal segment slightly longer than second, the former more deeply infuscated than the latter; arista plumose on entire length on upper side, and with two or three hairs at the tip on lower side; palpi yellow. *Thorax.* Testaceous yellow on pleurae, darkening to a reddish-brown on dorsum and scutellum, the dorsum sometimes with indeterminate paler longitudinal markings anteriorly. Six rows of fine acrostichal bristles; three pairs post-sutural dorso-central bristles, 1 prealar bristle, 4 post-sutural bristles on area above base of wing; one pair lateral and one pair apical scutellar bristles; sternopleurals 2, with a few small bristles between them. *Abdomen.* Shining brown above paling to testaceous below; genitalia inconspicuous. *Legs.* Testaceous. A preapical bristle present on posterodorsal surface of hind tibia; the basitarsi of the fore legs of the male without combs. *Wings.* Hyaline, with a faint yellowish-grey tinge; halteres testaceous.

Holotype, allotype and paratypes bred from pupae taken by Mr. E. G. Gibbins at Jinja, Uganda (R. Nile), 4th March, 1932, in British Museum collection. Reg. No. B.M. 1934 : 259.

References.

Duda, O., 1924*a*, Beitrag zur Systematik der Drosophiliden unter besonderer Berücksichtigung der paläarktischen u. orientalischen Arten (Dipteren). *Arch. Naturg.* **90**. (A) 3 : 172–234.

Duda, O., 1924*b*, Revision der europaischen Arten der Gattung *Drosophila* Fallen (Dipt.). *Ent. Med.* **14** : 246–313.

Sturtevant, A. H., 1921, The North American species of *Drosophila*. *Carnegie Inst. Wash. Publ.* **301**.

* Smart, J., 1937, The larva and pupa of *D. gibbinsi* Aub. *Proc. R. ent. Soc. Lond.* (B) **6** : 170–172.

ON THE LARVA AND PUPA OF *DROSOPHILA GIBBINSI* AUB.

By John Smart, Ph.D., F.R.E.S.

(*British Museum (Natural History)*.)

Along with the reared imagines of *D. gibbinsi* Aub. received at the British Museum (Natural History) from Mr. E. G. Gibbins, was a series of larvae and pupae. As Aubertin (1937) pointed out these showed considerable structural adaptation to their aquatic environment, and the opportunity is now taken of noting these adaptations in greater detail.

The material was collected at Jinja, Uganda (R. Nile), on 4th March, 1932, by Mr. E. G. Gibbins; it is now in the British Museum (Natural History).

The larvae are described by Mr. Gibbins as living in a "torrent," along with those of *Simulium* sp. They were present on submerged rocks and vegetation. The pupae were out of the water for the most part, those submerged being on vegetation that probably had been submerged unnaturally. The habitat appears to be a unique one for Drosophilid larvae.

The larva, fig. 1, *a* and *b*, measures about 5 mm. in length. It has a relatively tough integument of a dirty brown colour covered with minute papillae. Ventrally the papillae are not so conspicuous, but the flatter ventral surface has a series of segmental pads armed with hooks as shown in fig. 1, *a* and *b*. These pads occur on segments 4–10, each segment has two antero-lateral pads with hooks pointing posteriorly and one medio-posterior pad with its hooks directed anteriorly. Details of these hooks are shown in fig. 1, *e*, *f* and *g*. The buccal armature is strong and well developed. The anterior spiracles, fig. 1, *h*, at any rate in the final larval instar, are in the form of tufts on eversible stalks, the whole being withdrawable by inversion of the stalk inside the body of the larva. In this position they lie with the tufted portion retracted into the stalks. The stalk is of the same length as the rays of the tufted head and is equal to that of the cephalic skeleton. The posterior spiracles are situated close together on the apex of a syphon-like cone, the structure of which indicates that it has considerable powers of retraction and that when retracted the spiracles are probably covered up by the folded walls of the syphon.

The internal organs of the larvae were not sufficiently well preserved to permit of a description of its internal anatomy. It was found, however, that the gut contained a very large number of dipterous larval head capsules which appeared to be those of small chironomids.

The puparium, fig. 1, *d*, exhibits the same external features as the larva. It is ovoid in shape except the ventral surface, which remains relatively flat; it measures about 3·5 mm. in length. The anterior spiracles are fully and permanently extended.

No information is available as to the behaviour of any of the stages of *D. gibbinsi* in life beyond the locations in which the larvae and pupae were found. However, the structure of the larvae and pupae allow of certain deductions as to the mode of life.

The ova and younger larval stages are unknown. It is improbable that the eggs are just dropped into the water. They are more likely to be laid on stones and hanging vegetation just above water level and there kept moist by spray, or the lapping of the water, till they hatch. On hatching the young larvae would probably make their way into the water. The contents of the gut indicate carnivorous habits. The larva is not furnished with any special feeding mechanism, and it may therefore be assumed that it moves about in

search of its prey. This prey, in the mature larva at any rate, seems to consist of small Chironomid larvae which one might expect to occur in abundance in the film of algae, etc., covering the submerged stones and vegetation on which the larvae were found. Such prey, though passive when discovered, would necessitate a considerable mobility on the part of the larvae to reach it. A better mechanism than the opposed hooked pads could not be imagined for

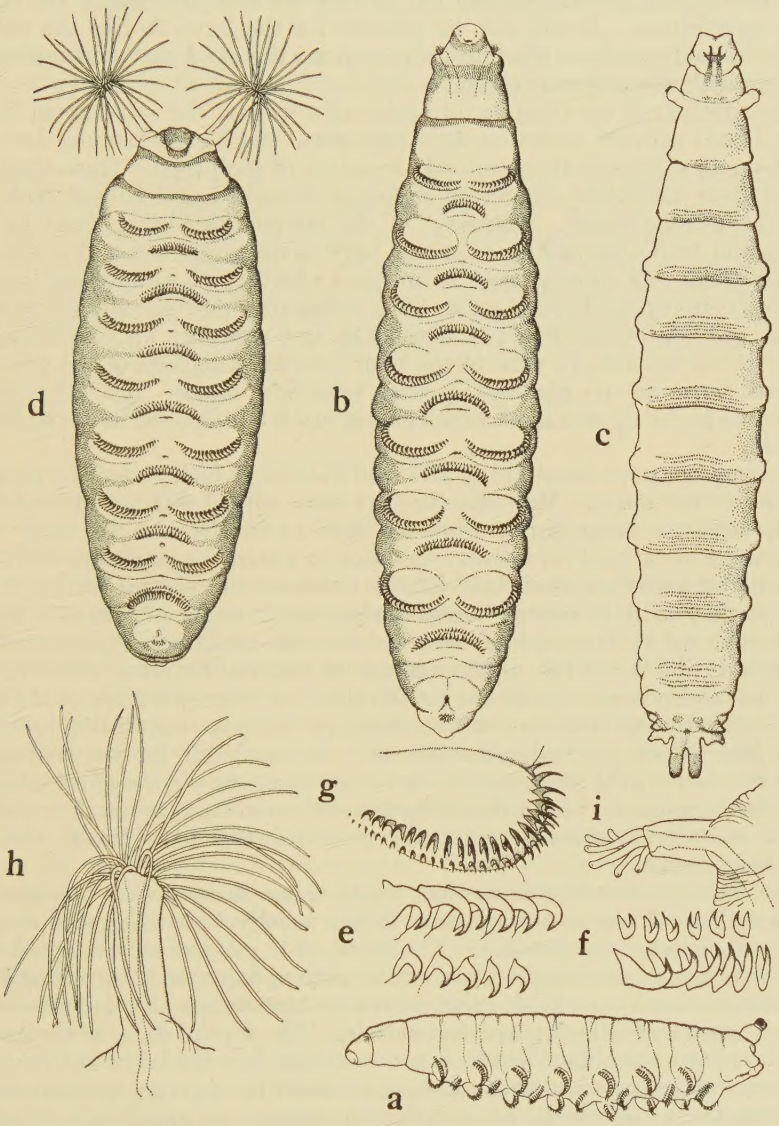

Fig. 1, *a*—Mature larva of *D. gibbinsi* Aub. × 11; *b*—Ventral surface of larva showing hooked pads. × 19; *c*—Ventral surface of larva of *D. melanogaster* Mg. for comparison. × 19; *d*—Pupa of *D. gibbinsi* Aub., ventral view. × 20; *e*—Enlarged view of hooks on ventro-lateral pad; *f*—Enlarged view of hooks on ventro-median pad; *g*—Fifth ventro-lateral pad. × 60; *h*—Anterior spiracle of larva extended. × 60; *i*—Anterior spiracle of larva of *D. melanogaster*. × 60. Drawn by Mr. A. J. Engel Terzi.

this purpose. If a single segment is considered it will be seen that longitudinal contraction will automatically drive the opposed hooks into the mat of algae and maintain a grip on it, while elongation of the segment will loosen this grip and disengage the hooks. Thus it will be apparent that the normal mode of progression found in the maggots of higher Diptera, namely a wave of segmental extension followed by contraction passing from the head backwards, will result not only in forward motion but in an automatic gripping of the surface of the substratum. It will also be possible for the larva to free the anterior part of its body while extracting its prey from the algal mat and maintain a firm grip with the posterior region.

The question of the possible formation of a web on the substratum formed of the larval salivary secretion does not arise. Such web-forming larvae as *Simulium* do not move about actively in search of their food. Once they have formed their web they remain on it unless disturbed and collect their food from the passing water. The prey of the larvae, presuming them to be a Chironomid with a normal mode of life, have to be sought out and it would be difficult under this circumstance to imagine a larva with an internal economy capable of supplying throughout its life a sufficiently profuse salivary secretion for the purpose of continuously extending and renewing an extensive web. As far as can be seen, in view of the poor internal condition of the preserved material, there are no abnormally large secretory organs. The Chironomids themselves probably spin a web which may give the Drosophilid larvae additional foothold.

The puparia were found firmly attached to leaves which, except by accident, were out of the water. How exactly they were affixed was not observed. It would, however, seem highly probable that as in the case in many other Cyclorrapha use is made of salivary secretion to fasten the puparium to the substratum and afford an extra hold for the hooks on the ventral surface to grip automatically with the contraction of the larval skin as the puparium is formed. This would not be inconsistent with the remarks made above about salivary secretion during larval life, as the amount of material required would be very much less and needed only at one special point of time in the life of the larva.

The structure of the anterior spiracles is probably an adaptation to aquatic larval life. They probably function as a tracheal gill for respiration. In larval life they would be protruded or retracted as the physiological condition of the larva required. After the formation of the aerial puparium their mobility is lost and they remain permanently extended and may act as cuticular respiratory organs.

The insect is remarkable in that, while many Acalypterate Diptera have adapted their larvae to aquatic life, it has usually been the more stagnant waters which have been invaded. The larvae of *D. gibbinsi* have adapted themselves to torrential waters, and like the SIMULIIDAE, BLEPHAROCERIDAE and other Nematocera that have adapted themselves to these waters they have developed efficient organs of adhesion and locomotion. The special form of the anterior spiracles may be to allow them to function as gills, but the larva has functional posterior spiracles and is thus enabled to leave its aquatic environment for pupation and so no special devices for the eclosion, as found in such aquatic Nematocera as the CULICIDAE and SIMULIIDAE, of the imago from a submerged pupa are required.

REFERENCE.

AUBERTIN, D., 1937, A new species of Drosophila, *D. gibbinsi* sp. n., from Uganda. *Proc. R. ent. Soc. Lond.* (B) **6**: 169.

NEW SPECIES OF COCCIDAE (HEMIPT. HOMOPT.) FROM MAURITIUS

By Raymond Mamet.

Communicated by Dr. O. W. Richards, F.R.E.S.

The new species described below have been kindly examined by Mr. E. E. Green, whom I thank for his invaluable assistance on many occasions.

Pedronia Green.

Green (1922, *Coccidae of Ceylon*, **5** : 364) erected this genus to contain a single species, *P. strobilanthis*, and a variety, *P. strobilanthis tenuispina*, characterised by the following diagnosis : " Insects ovoviviparous. Derm with stout conical spines. Antenna six- or seven-jointed, the terminal joint elongate. Without prominent chitinous anal lobes." It may be added, with the knowledge acquired by the study of the species described hereafter : Anal ring with six setae. Limbs well developed and stout. Antennae with from six to eight joints, of which the terminal joint is elongate.

This genus was hitherto recorded from Ceylon only.

Pedronia greeni sp. n.

Adult female (in 70% alcohol) oval in outline, somewhat convex, brownish to dark brown, coated with a white powdery secretion. Abdominal segments distinctly indicated, not produced laterally.

Antennae (fig. 1, *a*) eight-segmented; all the segments with several longish slender setae, terminal segment elongate and longest. Formula :—8, 2, 1, (3, 7), 5, (4, 6). *Eyes* distinct, somewhat prominent, submarginal. *Limbs* (fig. 1, *b*) well developed and stout : each segment furnished with several longish slender setae; tarsus of mid leg shorter than tibia, being about two-thirds its length, the two together shorter than femur + trochanter. Tibia with a pair of stout spur-like setae at the distal extremity of the inner side. Trochanter with a stout long hair. Coxa without translucent pores. Claw slender, acute. Tarsal digitules filiform, longer than claw and minutely knobbed. Ungual digitules longer than claw but shorter and thicker than tarsal digitules, with conspicuously knobbed extremities. Both *spiracles* of about the same size, without parastigmatic pores. Posterior extremity (fig. 1, *c*) with broadly rounded lobes. *Anal lobes* not sclerotised and not very prominent, furnished with one long, stout seta, arising from below the apex and on the ventral surface, and two large conical spines also arising from below the apex but on the dorsal surface. There is also a fairly long seta and other shorter ones adjacent to the long, stout one. *Anal ring* with two concentric series of oval bead-like cells and six longish stout setae which are shorter than the caudal ones. *Spines* (fig. 1, *d*) conical, sharply pointed, base approximately half height, well distributed throughout the dorsal surface of the cephalic and thoracic regions and more or less arranged in a single row on each abdominal segment; those on the margin of the abdomen stouter and longer than the others. Each spine is surrounded at its base by 3–5 roundish pores. In the cephalic dorsal region are four very slender conical spines (fig. 1, *e*) which have their bases about one-fifth their height. Spines are not present on the ventral surface. Body *setae* short, very scanty and spiniform on dorsum; very much longer and more numerous ventrally especially in the cephalic region. Lips of anterior and posterior *ostioles* large, tumid and with a few short spine-like hairs and numerous roundish pores. Ventral cicatrice not found. The *derm*

is crowded with circular to subcircular small pores. Very few *disc-pores* present on the ventral surface of the last abdominal segment.

Length, 1·5–2·0 mm. Breadth about half length.

Mauritius: Les Mares (2,200 ft.) on an indigenous orchid, probably a species of *Bulbophyllum* v.1934, 1935 (*R. Mamet*). Type in my collection.

Remarks. This insect is near *P. strobilanthis tenuispina* Green, but differs in the arrangement of the dorsal conical spines and in having antennae with eight segments.

It is with much pleasure that I dedicate this insect to Mr. E. E. Green, not only because *Pedronia* is a genus of his own creation, but also as a mark of gratitude for the kind interest he showed in helping me in many various ways.

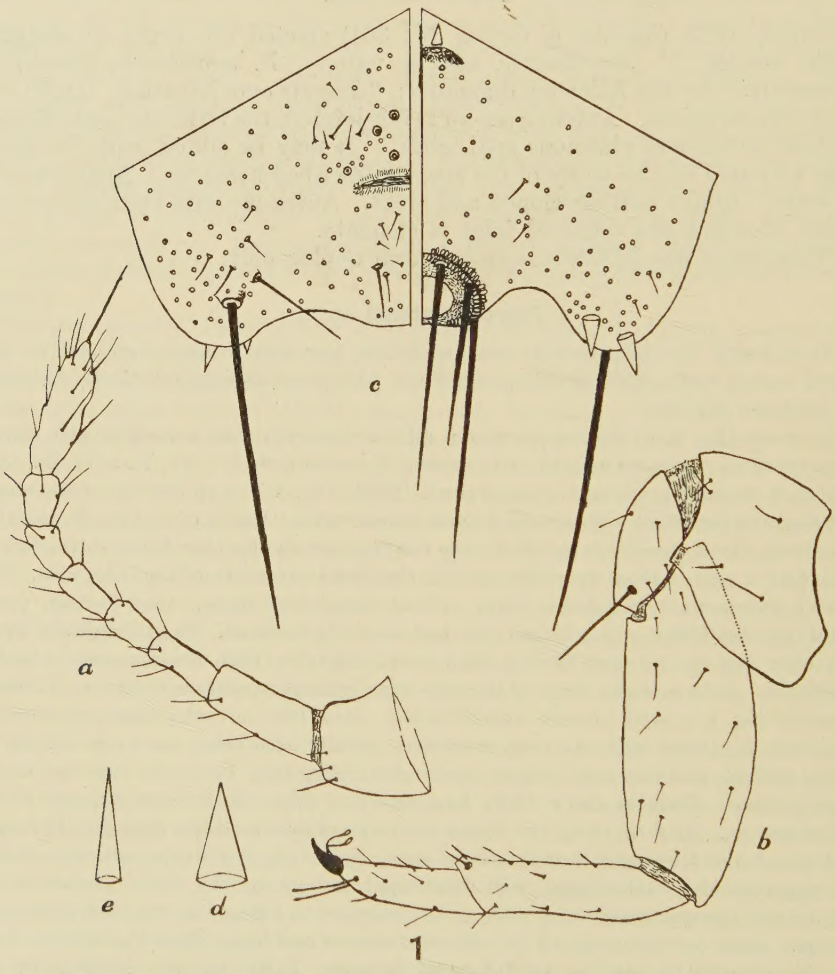

Fig. 1.—*Pedronia greeni* sp. n.—*a*, antenna; *b*, mid-leg; *c*, posterior extremity; *d*, stout spine; *e*, slender spine found in the cephalic dorsal region.

Lepidosaphes vermiculus sp. n.

Female puparium brownish, a little shining, narrow, narrower at its anterior part, convex dorsally, somewhat transparent, straight or slightly contorted. First exuviae very

shiny, golden yellow, transparent, extending beyond the front of the second exuviae which are longer and yellowish, with the sub-posterior margin brownish and obscured by a thin layer of secretion.

Length, 1·7–3·1 mm. Breadth, 0·3–0·4 mm.

Male puparium not found.

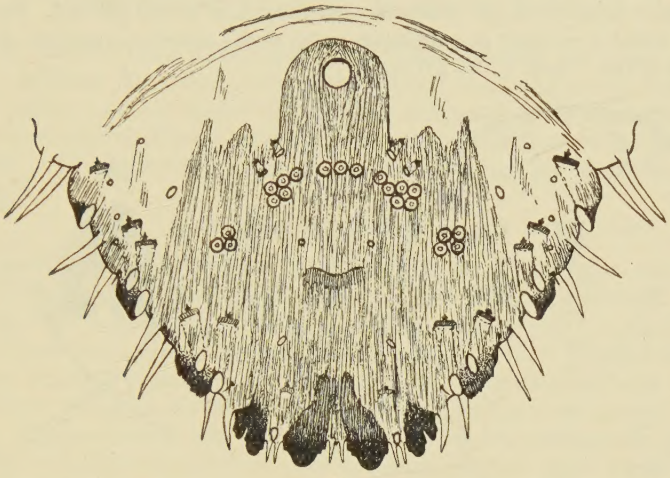

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FIG. 2.—*Lepidosaphes vermiculus* sp. n.—pygidium of adult female.

Adult female yellowish, elongate, broadest across the abdominal segments. Antennal tubercle with two stout bristles. *Anterior spiracles* with from 0 to 2 parastigmatic pores. Margin of meso- and meta-thorax with a few small pores. Abdominal segments short retracted into the body, not well produced marginally, with numerous small pores and a pair of spiniform squames on each lateral area. *Pygidium* (fig. 2) well sclerotised, with five groups of perivulvar pores: median group with from 2 to 4, arranged in a single row; upper laterals with from 4 to 6; lower laterals with from 3 to 4 pores. Two pairs of conspicuous trullae: median trullae most conspicuous, prominent, well sclerotised, with their bases extending into the pygidium, separated from each other by a space equal to about two-thirds their breadth, inner and outer basal margins parallel and free edges bluntly conical: inner edge notched twice, outer edge once. Second pair smaller, duplex: inner lobule more or less of the same form as that of median trullae, outer lobule smaller than inner lobule, and more or less pointed at its apex. There are three sclerotised marginal indentations beyond the lobes: first indentation serrulate. *Squames* spiniform and long: those at the apex of the pygidium shorter than those near the base. *Dorsal pores* very few but large and conspicuous. *Spines* short but stout.

Length, 1·0–1·3 mm. Breadth, 0·2–0·3 mm.

Adult male unknown.

MAURITIUS: Ilot aux Benitiers (an islet to the south-south-west of Mauritius and about 1,000 ft. from the mainland), 24.iv.1933. On leaves of *Cocos nucifera* (*R. Mamet*). Type in my collection.

Remarks. The specific name has been suggested by Mr. E. E. Green on account of the worm-like appearance of the female puparium. This species is highly parasitised by a small hymenopteron, most probably *Aspidiotiphagus*

citrinus Craw. (Hym. CHALCIDIDAE), which parasitises *Aspidiotus destructor* Sign. in Mauritius.

Asterolecanium morini sp. n.

Test of adult female pale yellow to bright yellow, approximately circular, glassy, moderately convex. Fringe colourless to yellowish, very short except at the posterior margin, where it is much longer. Posterior extremity more or less pointed. The shrivelled body of the insect is revealed as a brownish patch at the anterior extremity of the test.

Diameter of test : from 1·5 to 2·0 mm.

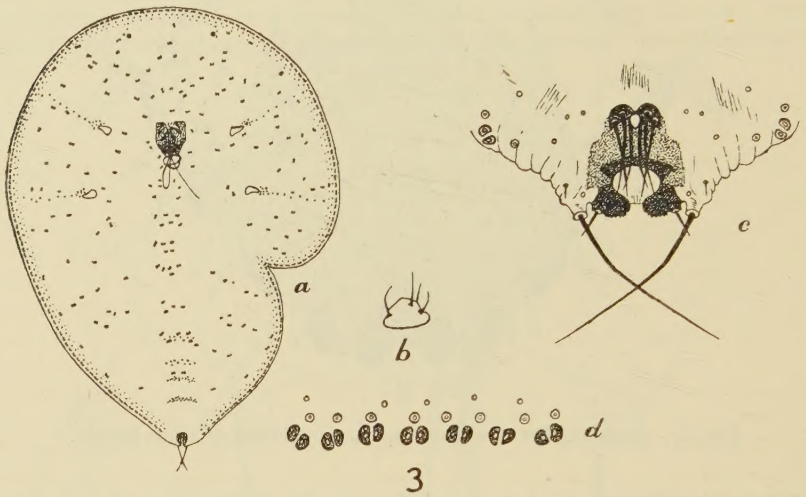

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FIG. 3.—*Asterolecanium morini* sp. n.—*a*, adult female showing arrangement of paired pores; *b*, antenna; *c*, posterior extremity; *d*, marginal pores.

Adult female (fig. 3, *a*) (after treatment with potash), roundish to pear-shaped, with posterior extremity somewhat pointed. Rostral loop about twice length of mentum, the latter short and oval. *Antennae* (fig. 3, *b*) rather prominent, sub-globular, each with four curved hairs. *Spiracles* conspicuous, occupying a situation approximately half-way between the margin and a median line. Parastigmatic pores minute, arranged in a single row, except close to the spiracles where they are clustered in a small group, connecting the spiracles with the margin. Ventral median surface of the last four abdominal segments with a number of small pores and very few minute spines. Abdominal extremity (fig. 3, *c*) slightly cleft. *Anal tubercles* moderately prominent, each bearing a long stout seta; the small inner lobules each armed with a short stout seta, the third pair of spines present and shorter than inner lobule ones. *Anal ring* with six stout hairs which do not project beyond the margin. *Margin* with a single continuous series, interrupted at the caudal extremity only, of thick-rimmed paired pores (fig. 3, *d*) and a double series of ventro-marginal circular pores of which those of the first series, that is, those nearer the paired pores, are much larger and more numerous than those of the second series. These paired pores are scattered on the dorsum but are more or less arranged in groups, particularly on the median dorsal areas of the meso- and meta-thoracic and abdominal segments and leaving a clear space between each group.

Length, 0·8–0·9 mm. Breadth, 0·6–0·7 mm.

MAURITIUS : Port Louis. On stems of *Pentas carnea*, forming pits, v.1935 (*G. Morin*). Type in my collection.

RESULTS OF THE OXFORD UNIVERSITY EXPEDITION TO SARAWAK (BORNEO), 1932. MANTODEA.

Von Max Beier, Wien.

Communicated by Dr. B. M. Hobby, F.R.E.S.

Das mir zur Bearbeitung übertragene Mantiden-Material der oben genannten Expedition umfasst 30 Arten, unter denen sich 2 neue und einige interessante, zum Teil bisher nur in einem Geschlecht bekannte Formen befinden. Es erscheint daher gerechtfertigt, über die interessante Ausbeute an dieser Stelle zu berichten. Die Typen der neuen Arten befinden sich im Britischen Museum zu London.

Amorphoscelis micans sp. n.

♂. Allgemeinfärbung gelblichbraun. Kopf jederseits am Scheitel mit unregelmässigen schwarzen Flecken, die Ozellen schwarz gerandet, sonst einfarbig gelbbraun. Nebenaugenhöcker des Hinterkopfes stark vortretend, rundlich, beulenförmig. (Antennen abgebrochen.) Pronotum flach, hinten kragenförmig erhoben, die beiden Tuberkel der Prozone nur als flache Scheiben angedeutet, die Tuberkel nahe dem Hinterrand klein und schwer erkennbar, kaum vorragend, die Metazone mit deutlichem, hinten etwas lamellär erhobenem Mediankiel. Elytren glashell, sehr stark irisierend, an der Einlenkungsstelle schwärzlich, das Costalfeld einheitlich rauchbraun, aber durchsichtig, distal mehr rötlichbraun, das Discoidalfeld an der Basis, beim Stigma, hinter diesem und an der Spitze mit rauchbraunen, aber durchsichtigen Flecken, die Längsadern hell, wenig deutlich braun gefleckt; intermediäre Längsadern fehlen; die Queradern bilden auffallend grosse Netzmaschen. Alae hyalin, gegen die Spitze angeraucht, das Costalfeld distal ziemlich dunkel rötlichbraun. Unterseite des Körpers gelblichbraun, nur die Pleuren und die Subgenitalplatte distal schwärzlich. Vordercoxen hell, vor dem Ende mit einem deutlichen, nahe der Mitte mit einem undeutlichen braunen Querband. Trochanteren hell. Vorderfemora hell, aussen mit 3 braunen Querbändern, innen mit verwaschenen bräunlichen Flecken. Vordertibien am Ende bräunlich, die Endklaue nur an der Spitze dunkel. Metatarsen mit dunklem Ring in der Mitte und am Ende, die übrigen Tarsenglieder nur an der Spitze geschwärzt. Mittel- und Hintercoxen einfarbig gelbbraun, Femora nahezu einfarbig, Tibien und Metatarsen mit 3 dunklen Querbändern, das 2. und 3. Tarsenglied nur an der Spitze geschwärzt, das 4. und 5. ganz dunkel. Endglied der Cerci blattförmig vergrössert, ungefähr so lang wie die 4 vorhergehenden Glieder zusammen.

Körper L. 20 mm., Pronotum L. 2 mm., Elytren L. 18 mm., Hinterfemora L. 5·8 mm., Hintertibien L. 5·5 mm., Metatarsus L. 3·5 mm., Cerci L. 3 mm.

Type: 1 ♂, Mt. Dulit, 4,000 ft., Moss forest, 29.x.1932, House Clearing, Sheet (light), 8 p.m.–10 p.m.

Von den bekannten orientalischen Arten leicht durch die Färbung und die verhältnismässig langen, fast gänzlich hyalinen Elytren zu unterscheiden.

Theopompula ocularis (Sauss.).

4 ♂♂, Mt. Dulit und Claudetown, vii., ix. und xi.1932.

Theopompa borneana Giglio-Tos.

2 ♀♀, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 24. und 31.viii.1932.

Hapalopeza nitens (Sauss.).

4 ♀♀ vom Mt. Dulit, x. und xi.1932.

Tropidomantis tenera (Stål).

2 ♂♂, 1 ♀, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 19.viii, 30.viii. und 19.ix.1932.

Miromantis mirandula (Westw.).

1 ♂, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 31.viii.1932, light trap.

Xanthomantis flava Giglio-Tos.

1 ♂, Mt. Dulit, 4,000 ft., Moss forest, 18.x.1932, in house, at light.

Amantis reticulata (Haan).

2 ♂♂, Mt. Dulit, 19.viii. und 28.x.1932.

Gonypeta borneana Giglio-Tos.

1 ♂, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 5.x.1932.

Gimantis insularis sp. n.

♂. Allgemeinfärbung ziemlich dunkel graubraun. Frontalschild quer, der Dorsalrand in der Mitte stumpfwinkelig zulaufend, die Scheibe schwarz, nur die Vorderecken und das dorsale Medianeck gelblich. Scheitel leicht gewölbt, die Nebenaugenhöcker vollständig eingeebnet, weder über die Augen noch über das Niveau der mittleren Partie des Scheitels erhoben. Pronotum in Form und Skulptur wie bei *authaemon*, die beiden einander genäherten Tuberkelchen am Hinterrande jedoch etwas stärker ausgeprägt. Scheibe des Pronotum ebenso wie der Scheitel fein dunkel punktiert, aber sonst ohne Zeichnung. Elytren das Abdomen weit überragend, fast hyalin, ziemlich dicht mit kleinen borstentragenden Pünktchen bestreut und mit zahlreichen unregelmässigen bräunlichen Pigmentflecken versehen, die Längsadern hell und dunkel gefleckt. Alae sehr schwach angeraucht, wie die Elytren mit borstentragenden Pünktchen bestreut. Vordercoxen einfarbig rötlichbraun. Vorderfemora mit deutlich gebogenem Dorsalrand und daher ziemlich kräftig erscheinend, aussen dunkel punktiert und mit einer unregelmässigen Längsreihe von Körnchen besetzt, innen rötlichbraun mit 2 dunklen Querbändern in der distalen Hälfte, die beiden basalen Aussendornen einander kaum genähert. Vordertibien mit 10 Aussendornen und 8 Innendornen, die Innenseite mit 3 schwarzen Querbändern. Mittel- und Hinterbeine gelblichbraun mit rötlichbraunen Flecken, die auf den Femora und Tibien keine geschlossenen Ringbänder bilden. Thorakalsternite schwärzlichbraun, Abdominalsternite, besonders am Hinterrand, ebenfalls schwärzlichbraun. Cerci die Subgenitalplatte etwas überragend. Styli auffallend lang, geringelt und beborstet.

Körper L. 22 m., Pronotum 4 mm., Elytren 22 mm.

Type: 1 ♂, Sarawak, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 5.x.1932, in house.

Das Genus *Gimantis* war bisher nur in 2 Arten—*authaemon* (W. Mas.) und *assamica* (G. Tos)—aus Hinterindien bekannt. Es liegt nun von ihm auch ein Vertreter von den Sundainseln vor, der sich von den erwähnten Arten vor

allem durch die gänzlich eingeebneten Nebenaugenhöcker des Scheitels, die geringere Länge des Pronotum und durch nur 8 Innendornen an den Vordertibien unterscheidet.

Euchomenella heteroptera (Haan).

2 ♂♂, foot of Mt. Dulit, 28.viii. und 22.ix.1932, davon eines mit der ungewöhnlichen Pronotum-Länge von 38 mm.

Haania intermedia (Werner).

Diese interessante Art wurde von Werner fälschlich zur Gattung *Parairidopteryx* gestellt. Der paarige Stirnfortsatz neben den Augen, das lange Pronotum, die beiden Dorsaldornen der Vordertibien und deren stark verlängerter Innendorn sowie der lange Metatarsus der Hinterbeine lassen aber keinen Zweifel an der Zugehörigkeit zum Genus *Haania* aufkommen. Es liegen 1 ♂ und 1 ♀ vor, ersteres vom Mt. Dulit, R. Koyan, 2,500 ft., primary forest, 26.xi.1932, letzteres vom Mt. Dulit, 4,000 ft., Moss forest, 28.x.1932. Sehr auffallend ist das noch nicht beschriebene Weibchen durch die scheibenförmig verbreiterte Supracoxalerweiterung des Pronotum und die verhältnismässig langen Elytren, die das ganze Abdomen bedecken, was sonst bei *Haania* nie der Fall ist. Die Farbe des Weibchens ist dunkelbraun mit hellen Flecken. Die Seitenloben der Abdominalsegmente sind auffallend kurz, dreieckig und nicht weiter gezähnt oder gelappt. Die Art zeichnet sich durch relativ kurze Stirnfortsätze neben den Augen und den hinten sehr stark lamellär erhobenen Pronotumkiel aus.

Körper L. ♂♀ 19 mm., Pronotum L. ♂ 5·4 mm., ♀ 6 mm., B. ♂ 2·3 mm., ♀ 3 mm., Elytren L. ♂ 19 mm., ♀ 13 mm., Metatarsus post. ♂ 5·8 mm., ♀ 5·5 mm., 2.–5. Tarsenglied der Hinterbeine ♂ 2·5 mm., ♀?.

Leptomantis sumatrana Giglio-Tos.

5 ♂♂, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 29.viii.–23.ix.1932. Die Tiere scheinen einer kleineren Rasse anzugehören, da das Pronotum nur 8·5 und die Elytren 15 mm. messen.

Majangella moultoni Giglio-Tos.

2 ♂♂, Mt. Dulit, 4,000 ft., Moss forest, 21.x.1932.

Deroplatys shelfordi Kirby.

Von dieser seltenen, bisher nur im männlichen Geschlecht bekannten Art liegen 1 ♂ und 1 ♀ vom Mt. Dulit, 4,000 ft., Moss forest, 25. und 26.x.1932, vor. Das Männchen ähnelt habituell und besonders in der Form des Pronotum ausserordentlich der *D. moultoni* Giglio-Tos, hat aber ein etwas weniger hohes Frontalschild und eine einfarbig helle Innenseite der Vordercoxen, also keine schwarzen Flecken an den Dornen. Die Masse der beiden Exemplare betragen: Körper L. ♂ 50 mm., ♀ 65 mm., Pronotum L. ♂ 17 mm., ♀ 27 mm., B. ♂ 12 mm., ♀ 21 mm., Elytren L. ♂ 39 mm., ♀ 33 mm.

Deroplatys moultoni Giglio-Tos.

2 ♂♂, 1 ♀, 1 Larve, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 16.viii.–26.ix.1932.

Deroplatys truncata (Guér).

1 ♂, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, ix.1932.

Tenodera aridifolia (Stoll).

1 ♂, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 2.viii.1932.

Statilia maculata (Thunb.).

7 ♂♂, 2 ♀♀, sämtliche vom Mt. Dulit, 19.viii.–20.ix.1932.

Hierodula (*Hierodula*) *dyaka* Westw.

1 ♂, 1 ♀, Mt. Dulit, 25.viii. und 21.x.1932.

Hierodula (*H.*) *gracilicollis* Stål.

1 ♂, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 4.x.1932.

Hierodula (*H.*) sp.?

1 ♀, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 11.x.1932. Das Tier ist wegen der in der Artsystematik dieser Gattung herrschenden Verwirrung vorläufig nicht näher bestimmbar.

Anaxarcha limbata Giglio-Tos.

2 ♂♂, 2 ♀♀, Mt. Dulit, 4,000 ft., Moss forest, 4.–21.x.1932.

Psychomantis borneensis (Haan).

1 ♂, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 2.ix.1932.

Acromantis westwoodi Giglio-Tos.

1 ♂, 1 ♀, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 1. und 10.ix.1932.

Odontomantis micans (Sauss.).

1 ♂, 1 ♀, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 19.ix. und 5.x.1932.

Odontomantis rhyssa Werner.

Von dieser nach einem einzigen Weibchen beschriebenen, sehr aberranten, an der Granulation des Pronotums leicht kenntlichen Art liegen 1 ♂ und 1 ♀, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 22.viii.1932 und Mt. Dulit, 4,000 ft., Moss forest, 14.x.1932, vor. Die Masse der beiden Tiere betragen: Körper L. ♂ 19 mm., ♀ 28 mm., Pronotum L. ♂ 5·5 mm., ♀ 7 mm., B. ♂ 2 mm., ♀ 2·8 mm., Elytren ♂ 14 mm., ♀ 18 mm.

Hestiasula phyllopus (Haan).

5 ♂♂, Mt. Dulit, 4.ix.–27.x.1932.

Hymenopus coronatus (Ol.).

1 ♀, R. Kapah, trib. of R. Tinjar, 24.x.1932.

Ceratocrania macra Westw.

1 ♂, foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 1.ix.1932.

A NEW SPECIES OF *ANOPHELES* FROM THE ANGLO-EGYPTIAN SUDAN

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With Plate 1.

The following description is made from specimens bred from larvae which were collected in February 1937 at Gebel Moya, 13° 28′ N., 33° 22′ E., about 21 miles from Sennar in the Blue Nile Province. This species has almost dark wings and bears a superficial resemblance to a member of the subgenus *Anopheles*. Structural characters of the larva and adult, however, show that it belongs to the subgenus *Myzomyia*, being, like *A. apoci* Marsh, not readily distinguishable as a member of this sub-genus.

I am much indebted to Professor P. A. Buxton and Sir Rickard Christophers who kindly advised me in describing this species.

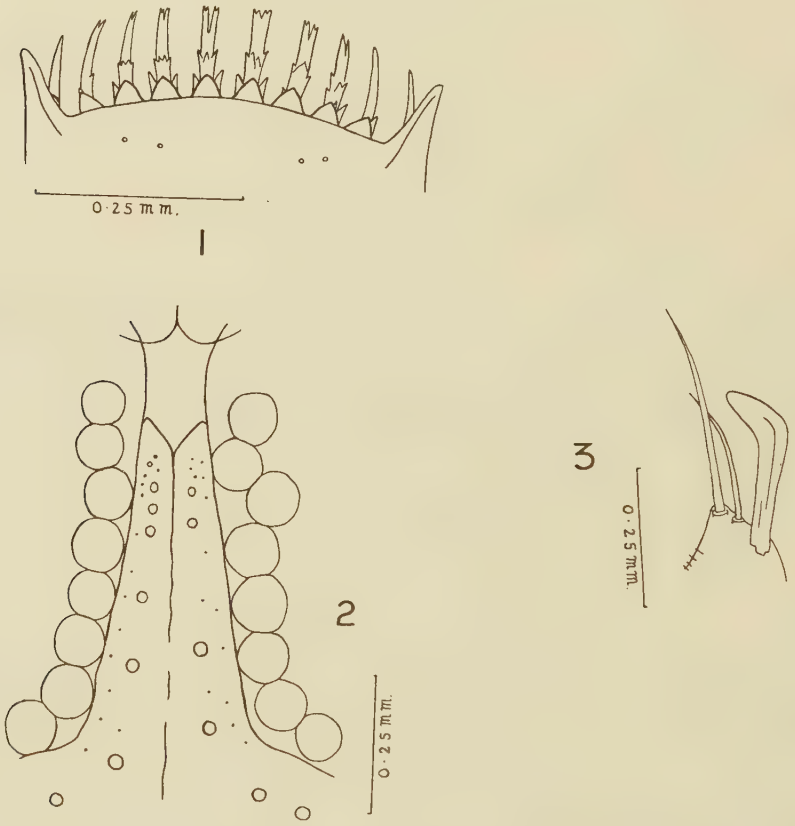
Anopheles (Myzomyia) rupicolus sp. n.

Adult, ♀. A moderate-sized anopheline (wing length 2·7 to 3·1 mm.) with pale thorax and dark legs and with wings appearing dark to the naked eye. *Head.* Inter-ocular space of vertex narrow, scales dark at back of occiput, white on vertex. Conspicuous white vertical tuft present. Ocular scales narrow. Vertical chaetae dark, extending forward into inter-ocular space. Head scales truncated with striations reaching ⅔ of length from apex. Antennae devoid of scales. Palpi of uniform thickness, narrow with appressed scales, without pale markings. Palpal index about 0·3. Mandible with about 37 teeth and expanded end. *Pharynx.* Teeth, not differentiated into rods and cones, usually 8 to 10 in number. Teeth with a conspicuous basal bulb which does not encroach on the pharyngeal bar, with no pediment crest but with large basal spicules. Filament of tooth with numerous spicules and a fimbriated end. No spicules on pharyngeal ridges. *Thorax.* Mesonotum pale with transparent appearance, with brown chaetae but devoid of scales except for pale median tuft on interior promontory. Pronotal lobes without scales. Propleural hair, one. *Wing.* Clothed chiefly with dark brown scales but having a few lighter scales which are variable in position and number. Usually there is on the costa a faint subcostal pale area and a more indistinct preapical area; there are a few pale scales opposite these

areas on the first longitudinal vein. Occasionally a sector pale area is represented by a few pale scales. In about fifty per cent. of specimens the wing appears entirely dark unless illuminated successively from different directions. Basal third of first longitudinal vein and wing field posterior to this vein dark. Scales narrow. Forked cell index 1·8 to 2·3. *Legs.* Dark with no pale markings. Coxae without scales. Trochanters of all legs with scales and hairs. *Abdomen.* Entirely devoid of scales.

Adult, ♂. In general as in female. Club of antenna unicolorous. Ungues normal.

Hypopygium. Parabasal spines five in number with arrangement and relative length usual in sub-genus *Myzomyia.* Harpago with an apical spine slightly longer than the club which is stout and curved inwards. Between the two is a slender spine about ¾ the length of the club. Phallosome moderately straight with about five leaflets on each side. Larger leaflets serrated along inner edge.



Figs. 1–3.—*Anopheles rupicolus* sp. n. 1, pharyngeal armature of ♀; 2, vertex of ♀; 3, apex of ♂ harpago.

Pupa. Paddle. With external edge almost smooth in anterior half, in posterior half spines passing into fine hairs which extend to near base of paddle hair but not along inner border of paddle. Midrib extending to margin of paddle. Paddle hair curved, about ⅓ length of paddle. Accessory paddle hair unbranched or with two or three branches, variable in the same individual.

ENGRAVED BY STAR ILLUSTRATION, LONDON.

Breeding place of a new species of *Anopheles*.

Spine A. Segment VIII, about ½ length of segment, branched; accessory hair branched. VII sharp, ½ length of respective segment. IV, chitinised, ⅓ length of segment, III very small. *Hair B.* III to VII branched, over ½ length of segment. *Hair C.* VII variable, V and VI simple, III and IV branched.

Larva. Head. Dark markings normal. Inner anterior clypeal hairs well separated, all clypeal hairs usually simple. Inner sutural hair simple, outer sutural with three or four branches. Antennal shaft hair short and simple. Base of antenna with spicules on inner surface. Tip of antenna with spine slightly longer than papilla. Maxillary palp with cone longer than finger. *Thorax.* Shoulder hairs: inner and middle pair with 14 to 17 branches. Palmate hair with 10 to 12 leaflets. Pleural hairs: prothoracic, two simple, one feathered; mesothoracic, one simple, one with 4 or 5 branches; metathoracic, one simple, one with 5 to 9 branches. *Abdomen.* Palmate hairs: segment I about 10 leaflets, pale and narrow with few or no shoulder serrations, filament about ⅓ length of blade. II to VII well developed and irregularly pigmented, II and VII with about 10 to 13 leaflets and filament about ⅓ length of blade, III to VI with 14 to 18 leaflets and some shoulder serrations, often against filament which is usually about ⅕ length of blade. Post-spiracular hair with about 6 branches, saddle hair split into two. Tergal plates of moderate size, paired accessory plates absent. Spiracular chitinisation not touching median plate.

Egg. Unknown.

Distribution and breeding habits. Larvae have been collected only on Gebel Moya, a few in a metal water tank and many hundreds in a deep cleft in the rock (plate 1).

Systematic position. The wing markings and characters of the pharyngeal armature and male hypopygium indicate that the species is allied to *A. rhodesiensis* Theo. It differs from the latter in having 37 teeth on the mandible which is expanded at the tip, dark palpi with a higher index, very faint pale marks, less than four, on the costa, no pale area on the basal third of the first longitudinal vein, and in the larva: the clypeal hairs usually simple. The mandible of *A. rhodesiensis* is not expanded at the end and has 80 teeth (Christophers 1931).

Type specimens in the British Museum.

References.

Christophers, S. R., 1933, "Family Culicidae. Tribe Anophelini." *Fauna Brit. India*, Diptera, **4**: 371.

Christophers, S. R., and Puri, I. M., 1931, "Notes on some anopheline mosquitoes collected in Sierra Leone including differentiation of *Anopheles d'thali* Patton (Mediterranean) as a distinct species from *Anopheles rhodesiensis* Theo. (Ethiopian)." *Ind. J. med. Res.*, **18**: 1133–1166.

Plate 1.

Fig. 1. View from Gebel Moya looking east, breeding place of *A. rupicolus* in left hand bottom corner.

2. Closer view of breeding place.

3. Tank containing a few larvae of *A. rupicolus*.

Book Notice.

Die Grossschmetterlinge der nordfriesischen Insel Sylt. By G. Warnecke. 8vo. Stuttgart (A. Kernen Verlag), Rmk. 3.00. pp. 74, 10 figs. [1937.]

This booklet on the Macrolepidoptera of a north Friesian island was published originally as a series of articles in *Entomologische Rundschau*, Jahrgang 53 and 54, during 1936 and 1937.

Of the 324 species recorded from north Friesian islands, 248 are recorded from Sylt and, in a supplementary list, a further 8 records brings the total to 256.

After an introduction dealing fully with all matters relating to the Lepidoptera of Sylt, including a bibliography of 22 titles, follows the systematic enumeration of the species which extends to 28 pages and gives the dates of capture, collector and exact locality of each species recorded. In many cases details of food-plants are added.

Book Notice.

La Faune de la France en Tableaux synoptiques illustrés. Fasc. 8. Diptères par E. Séguy. 8vo. Paris (Librarie Delagrave). pp. vi + 216, 844 figs. [1937.]

This book is, as stated in its title, a list of the Diptera of France in synoptic tables or keys.

1600 species are dealt with, comprising 540 genera, and with copious illustrations. As is to be expected in a volume so compressed—the volume would very easily slip into a jacket-pocket—no room is found for synonyms, but brief notes are given as to life-history, localities frequented, and time of appearance of the species.

In order to save space a system of notation by symbols is used for the couplets of the keys. A series of footnotes indicates the origin and meaning of the names used.

An index of families and genera, a short select bibliography and list of contents complete the work.

It may be remarked that this volume is one of a series quite distinct from the larger " Faune de France " volumes.